

Database Essentials 1

LESSON SKILL MATRIX

Skills	Exam Objective	Objective Number
Working in the Access Interface	Display objects in the Navigation Pane. Change views.	1.3.4 1.3.5
Selecting Tools and Commands		
Defining Data Needs and Types	Change field data types.	2.4.5

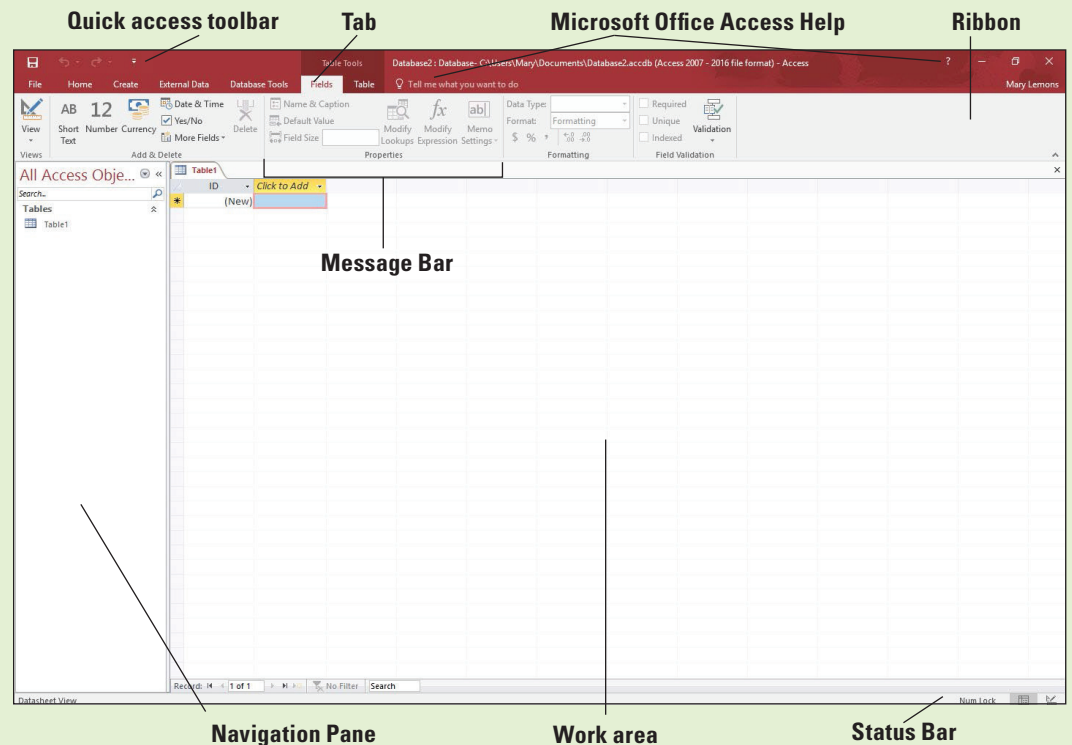
SOFTWARE ORIENTATION

The Access Opening Screen

Before you begin working in Microsoft Access 2016, you need to be familiar with the primary user interface. In the next section, you will be asked to open a new blank desktop database in Access. When you do so, a screen appears that is similar to the one shown in Figure 1-1.

Figure 1-1

Opening screen for new blank Access database



When you create a blank database in Access, the opening screen provides you with a workspace in which to build a database. Being familiar with the screen elements helps you understand important tools and information. The elements and features of your screen may vary if default settings have been changed or if other preferences have been set.

GETTING STARTED

A **database** is a tool for collecting and organizing information. For example, as a database, a phone book organizes a large amount of data—names, addresses, and phone numbers—so you can access it by name in alphabetic order. Even a grocery list is a simple type of database. A computerized **database management system (DBMS)**, such as Access, enables you to easily collect large volumes of data organized into categories of related information. This type of database allows you to store, organize, and manage your data, no matter how complex it is, and then retrieve and present it in various formats and reports. Using a DBMS to organize data gives you the power to manipulate, view, and report the data in ways that other applications like spreadsheets and word processing documents cannot. As with any program, however, the first tasks are the most basic. This section shows you how to start Access and open an existing database.

Starting Access

Access 2016 runs on the Windows 7 and later operating systems, and the steps to start Access differ depending on the version of Windows you have installed on your system.

When you start Access, a start screen with several options related to creating a database appears. The Access startup screen allows you to create a new, custom web app database, a blank desktop database, a database from a template, open a recent database (if you have already created one), or search online for templates.

Take Note *A web app database is a type of database that was introduced in Access 2013. It allows you to share the database with others as a Microsoft SharePoint app (an application on a network-based service that allows for collaboration) in a web browser or through Office 365 (a subscription-based version of Office provided on the web).*

In Office 2016, you can sign into an Office application using your Microsoft or Organizational account. You can easily create a Microsoft account when you sign up for a Microsoft web service such as OneDrive, Xbox Live, Outlook.com, or other Microsoft service. An Organizational account is an account that your workplace or school would use to connect you to a Microsoft service. Once you sign in, your sign-in information will appear in the upper-right corner of each of the Office 2016 applications. This account information includes your name, email address, and user icon. You can use the Switch account command beside your user icon to sign in as a different user.

Microsoft enables you to sign into Office to make it easier for you to access and share your documents from virtually anywhere. You can open and save your documents using OneDrive, a free cloud-based file sharing service that can be accessed from any Internet-connected computer. Signing into Office also allows access to your personalized application settings and themes, and will even remind you where you left off in your document.

In this exercise, you learn to start Access from both Windows 10 and Windows 8 systems.

STEP BY STEP

Start Access in Windows 10

GET READY. Before you begin these steps, make sure that your computer is on. Sign on, if necessary.

1. Press the **Windows** key on the keyboard to display the Start menu.
2. Click **All apps**, point to **Access 2016** (see Figure 1-2), and then click **Access 2016** to start Access and display its Start screen (see Figure 1-3).

Figure 1-2

Open Access 2016

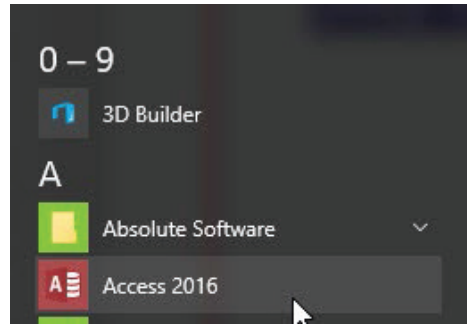
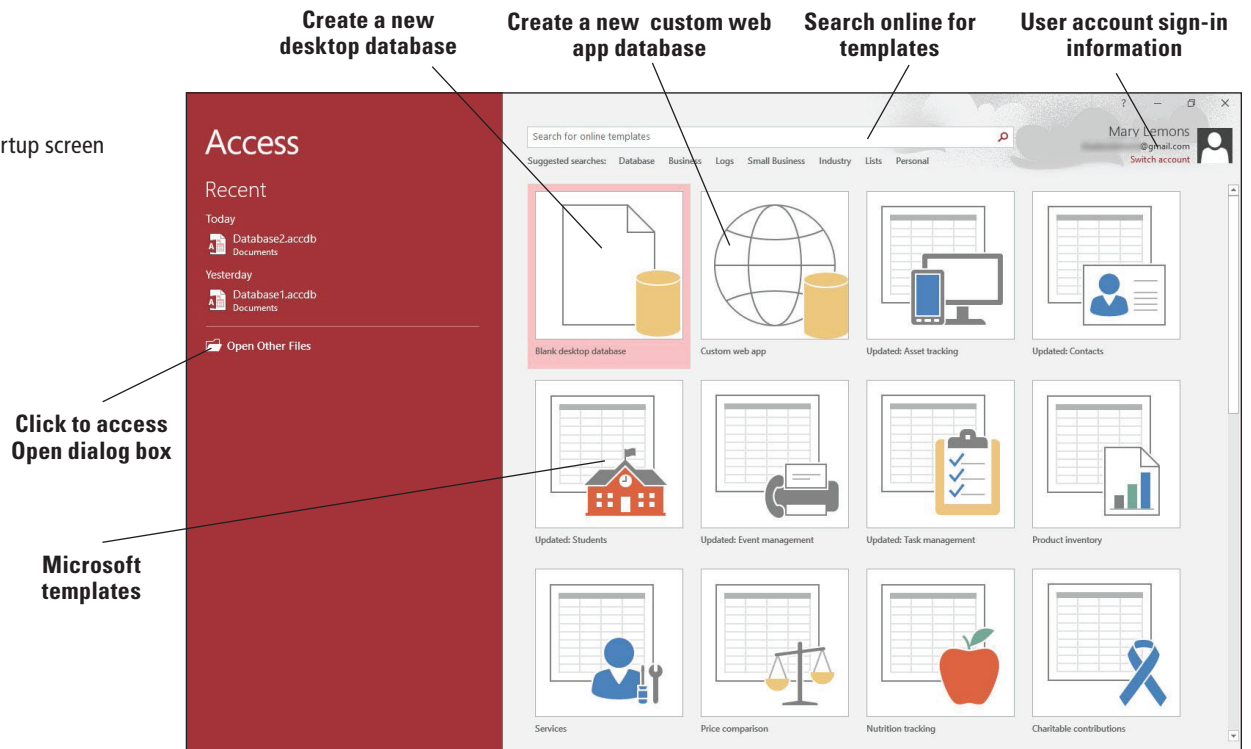


Figure 1-3

The Access startup screen



Clip art courtesy of Microsoft

Take Note If you preferred the Windows start screen from Windows 8, you can configure it to appear on Windows 10. Click Start, Settings, Personalization, and Start. Turn the Use Start full screen option to On.

PAUSE. LEAVE Access open to use in the next exercise.

STEP BY STEP**Start Access in Windows 8**

GET READY. Before you begin these steps, make sure that your computer is on. Sign on, if necessary.

3. When starting Windows 8, if the Windows 8 Start screen doesn't appear, press the **Windows** key on the keyboard to display it.
4. If necessary, scroll to the Access 2016 tile.
5. Click the **Access 2016** tile. The Access startup screen opens.

PAUSE. LEAVE Access open to use in the next exercise.

Take Note The Microsoft Office 2016 System, including Access 2016, is not compatible with Windows XP and earlier Microsoft Windows operating systems.

Opening an Existing Database

When you open an existing database, you access not only your previously entered and saved data, but also the elements you created to organize that data. In this exercise, you open a database that is in the beginning stages of development.

The Open Other Files command on the Access startup screen displays the Open screen. From there, you can choose to open a recent file, a file on your OneDrive location, This PC, or you can Add a Place or Browse for a file. The This PC command allows you to find files stored locally in a folder on your computer or on some type of removable media, or on a network drive. The Add a Place command allows you to set up network locations like OneDrive or an Office 365 SharePoint location. The Browse button opens the Open dialog box.

The left-hand pane of the Open dialog box lists the available locations for files, such as a folder, drive, or network/Internet location. Click the location, and the folders will be displayed in the folder list. From this list, you can double-click the folder you want to open. When you find the file you want, double-click the filename to open it or click it once to select it and then click the Open button.

STEP BY STEP**Open an Existing Database**

GET READY. The Access startup screen should be on the screen from the previous exercise.

1. Click the **Open Other Files** command on the left side of the Access startup screen. The Open screen appears, as shown in Figure 1-4.
2. Click **Browse**, navigate to the data files for this lesson, and then select **StudentInformation.accdb**, as shown in Figure 1-5.
3. In the *Open* dialog box, click the **Open** button. The existing database opens.

Take Note Your figures might look slightly different depending upon which folder you have stored your files.

Take Note As part of the Access 2016 security model, when you open a database outside of a trusted location or the database contains active content (content that can be misused by an unscrupulous person to cause harm to your computer), a Message Bar appears warning you that certain content has been disabled. If you know you can trust the database, click Enable Content. You can trust the databases downloaded from the book companion website, so click Enable Content on the Message Bar for all databases in this book.

PAUSE. LEAVE the database open to use in the next exercise.

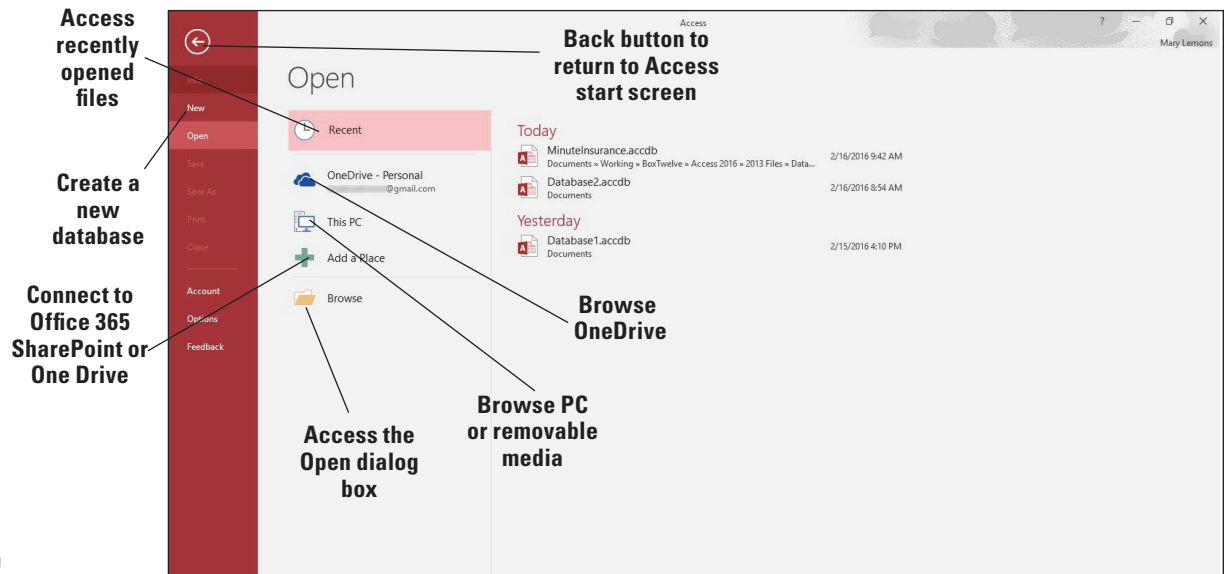


Figure 1-4

The Open screen

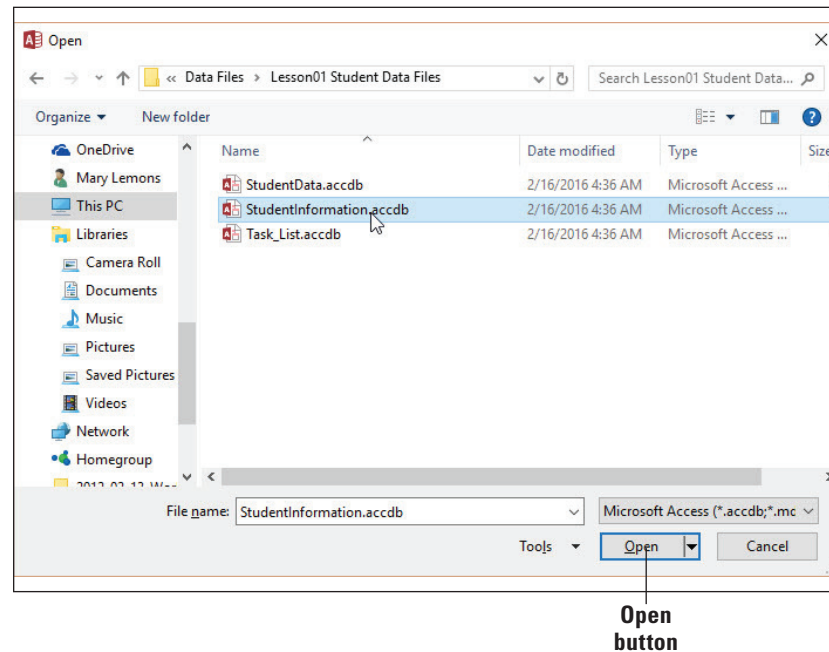


Figure 1-5

The Open dialog box

If you open a file in a multi-user environment such as a SharePoint drive, other users can read and write to the database as well; therefore, you may want to open the database with other options. Click the down arrow next to the Open button to view these options:

- **Open:** Opens with default access.
- **Open Read-Only:** Opens with only viewing ability and not editing ability. Others can still read and write.
- **Open Exclusive:** Opens so that the database is only available to you. Others will receive a message that the file is already in use.
- **Open Exclusive Read-Only:** Opens with only viewing ability and not editing ability. Others can only view and not edit the database.

Take Note Each time you start Access 2016, you open a new instance, or copy, of Access. You can only open one database at a time in a single instance of Access. In other words, you cannot start Access, open one database, and then open another database—not without first closing the first database. However, you can open multiple databases at the same time by double-clicking another database's icon. For example, to open two Access databases, start Access, open the first Access database, and then open a second Access database by double-clicking its database icon in File Explorer (referred to as Windows Explorer in previous versions of Windows).

WORKING IN THE ACCESS INTERFACE

The Access 2016 user interface was designed to help you find the commands you need quickly so that you can successfully perform your tasks. In this lesson, you will begin using the Navigation Pane, exploring the Ribbon and Backstage view.

SOFTWARE ORIENTATION

Navigation Pane

By default, the Navigation Pane, shown in Figure 1-6, appears on the left side of the Access screen each time you create or open a database.

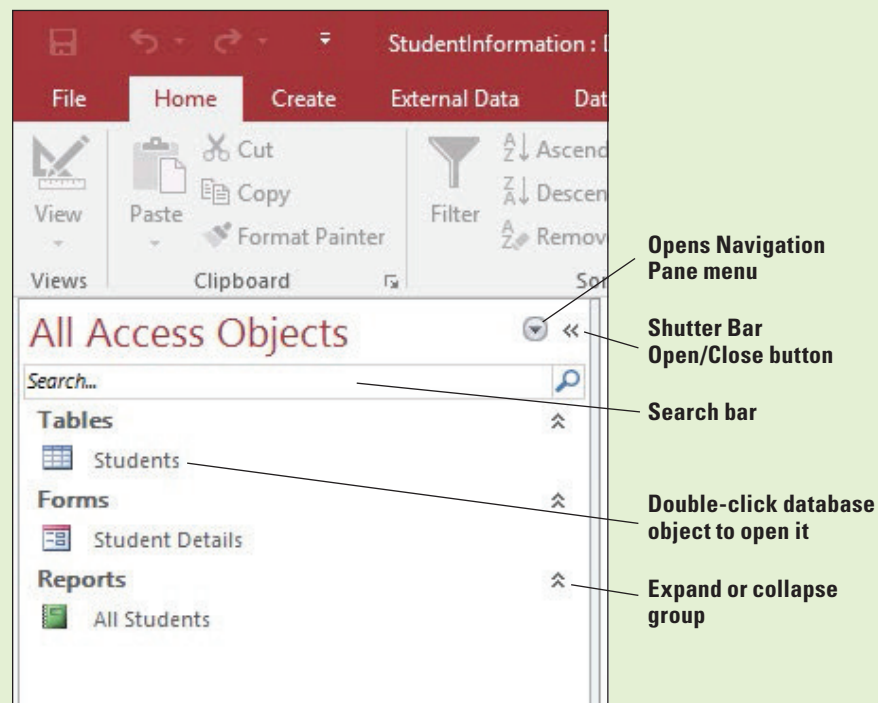


Figure 1-6
Navigation Pane

The Navigation Pane enables you to open, copy, and delete tables and other database **objects**. It also lists all the objects in your database, including: **tables** (the most basic database object that stores data in categories), **queries** (allow you to search and retrieve the data you have stored), **forms** (control data entry and data views and provide visual cues that make data easier to work with), and **reports** (present your information in ways that are most useful to you). You learn more about managing database objects (such as forms, queries, and reports) in later lessons of this book.

Using the Navigation Pane

Before you can create a database, you need to understand its most basic elements. This section introduces you to some of the elements in a database that help you organize data and navigate using the Navigation Pane, object tabs, and different views.

STEP BY STEP

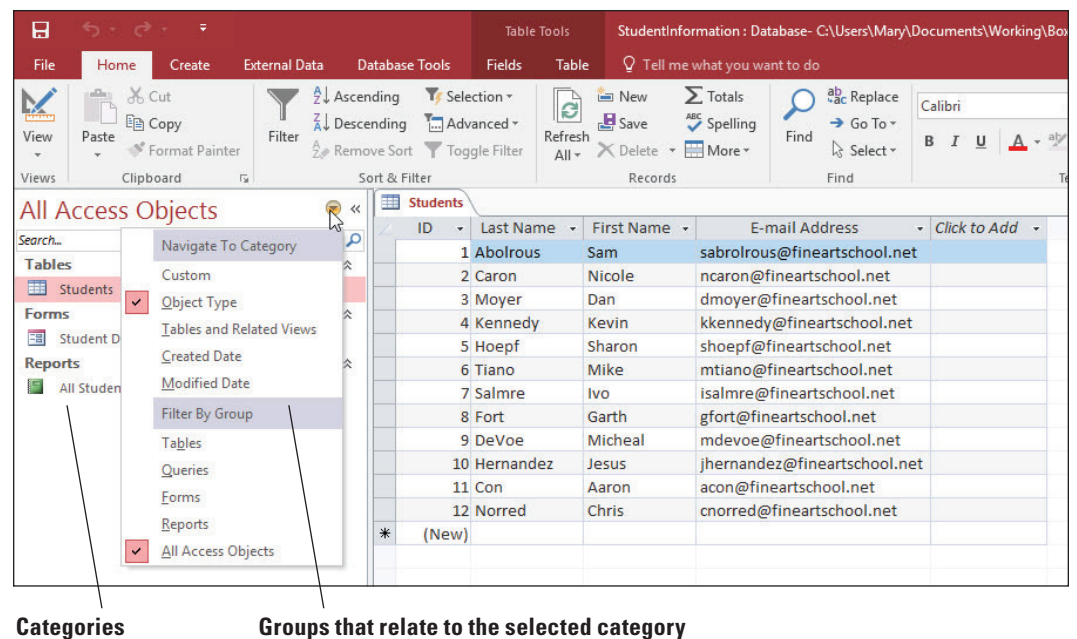
Use the Navigation Pane

GET READY. USE the *Student Information* database that is still open from the previous exercise.

1. In the Navigation Pane, double-click **Students** to display the table in the Access work area.
2. Click the **down arrow** next to All Access Objects at the top of the Navigation Pane to display the menu, as shown in Figure 1-7.

Figure 1-7

The Navigation Pane menu

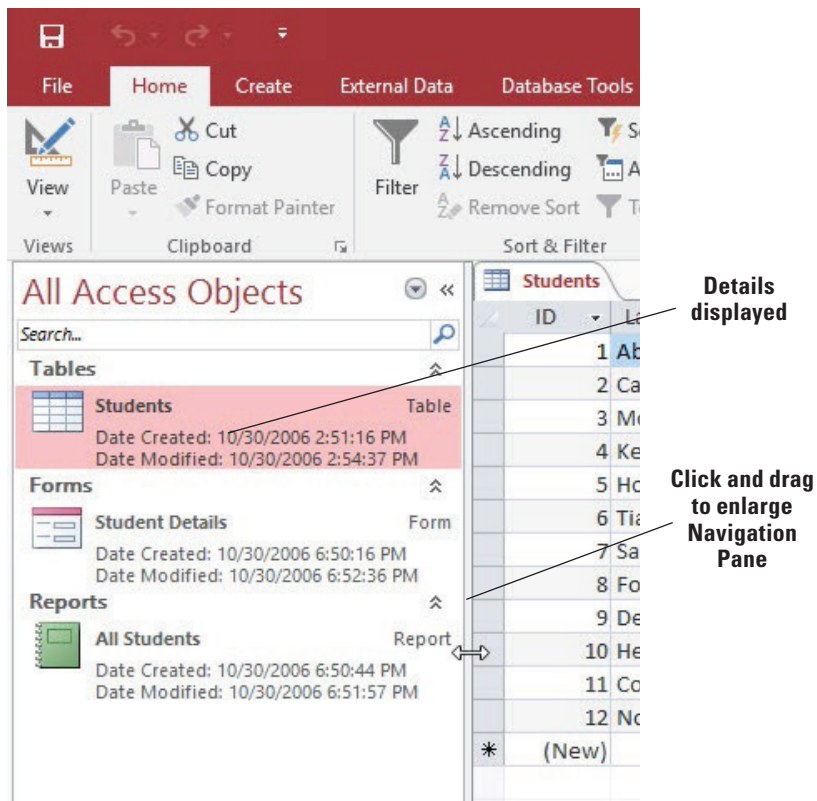


Take Note The Navigation Pane divides your database objects into categories, and those categories contain groups. The default category is Object Type, which groups database objects by their type—tables, forms, reports, and so on. You can change the category to Tables and Related Views, which groups the objects in a database by the tables to which they are related. You can also change the category to one of several other views as shown in Figure 1-7.

3. Click **Tables and Related Views**. The default group in this category is All Tables, which appears in the menu at the top of the Navigation Pane. Notice the Students table and all other objects related to it are displayed under the Students object tab.
4. Click the **down arrow** next to All Tables at the top of the Navigation Pane to display the menu again and then click **Object Type** to return to the original view.
5. Right-click in the white area of the Navigation Pane to display a shortcut menu. Click **View By** and then click **Details**.
6. The database objects are displayed with details. Click the right side of the Navigation Pane and drag to make it wider so all the information can be read, as shown in Figure 1-8.

Figure 1-8

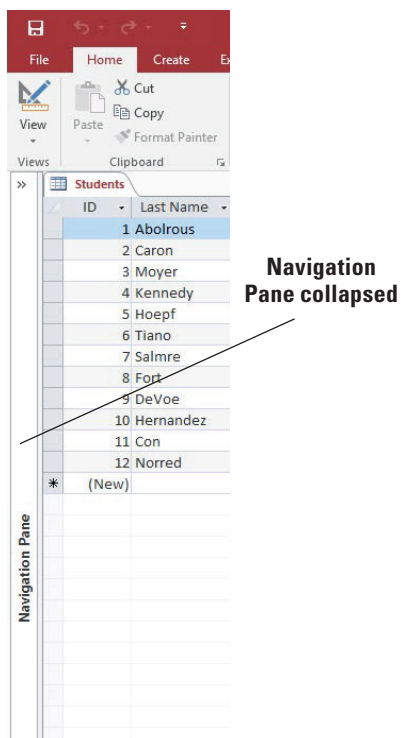
Widening the Navigation Pane



7. If the search bar does not appear at the top of the Navigation Pane, right-click the **All Access Objects** header of the Navigation Pane. On the shortcut menu, click **Search Bar**. A search bar is now displayed at the top of the Navigation Pane.
8. Right-click in the white area of the Navigation Pane, click **View By** and then click **List** in the shortcut menu to display the database objects in a list again.
9. Click the **Shutter Bar Open/Close** button to collapse the Navigation Pane. Notice it is not entirely hidden, as shown in Figure 1-9.

Figure 1-9

The Navigation Pane collapsed



10. Click the **Shutter Bar Open/Close** button to expand the Navigation Pane again.

PAUSE. LEAVE the database open to use in the next exercise.

Using Object Tabs

When you create a database in Access, all the objects in that database—including forms, tables, reports, queries—are displayed in a single window separated by tabs. Tabs help keep open objects visible and accessible. To move among the open objects, click a tab. To close a tab, click its Close button. You can also right-click a tab to display the shortcut menu, which you can use to save, close, close all, or change views. In this exercise, you practice opening and displaying object tabs.

STEP BY STEP

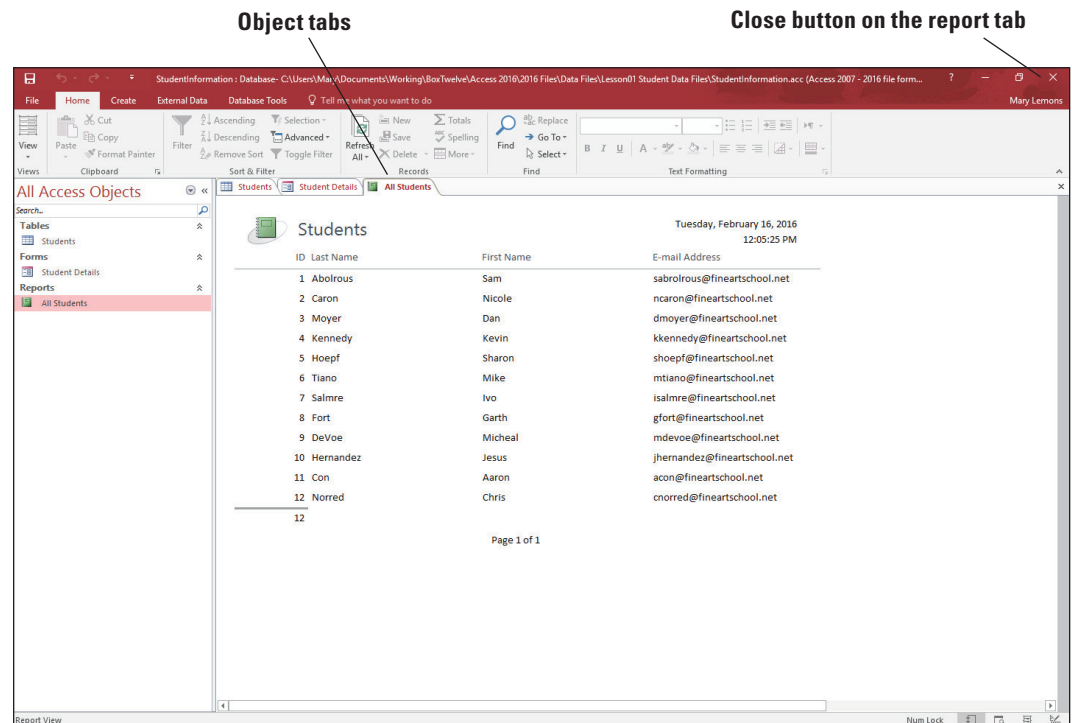
Use Object Tabs

GET READY. USE the **Student Information** database that is still open from the previous exercise.

1. In the Navigation Pane, double-click **Student Details**. A new object tab opens to display the form.
2. In the Navigation Pane, double-click **All Students**. A new object tab opens to display the All Students report tab along with the other two tabs, as shown in Figure 1-10.
3. Click the **Close** button on the report tab to close it.

Figure 1-10

A tab showing a report along with the other two tabs



4. Right-click the **Student Details** tab to display the shortcut menu. This menu allows you to save the object, close the object, close all object tabs, or change the object view.
5. Click **Close** to close the form.

PAUSE. LEAVE the database open to use in the next exercise.

Changing Views

Each database object can be viewed several different ways. The main views for a table are Datasheet View and Design View. Datasheet View can be used to perform most table design tasks, so you will probably use it most often. A **datasheet** is the visual representation of the data contained in a table or of the results returned by a query. A query is simply a question you can ask a table or another query.

To change the view, on the Home tab, click the down arrow on the View button and then choose a view from the menu. When you change views, the commands available on the **Ribbon** change context to match the tasks you will be performing in that view.

STEP BY STEP

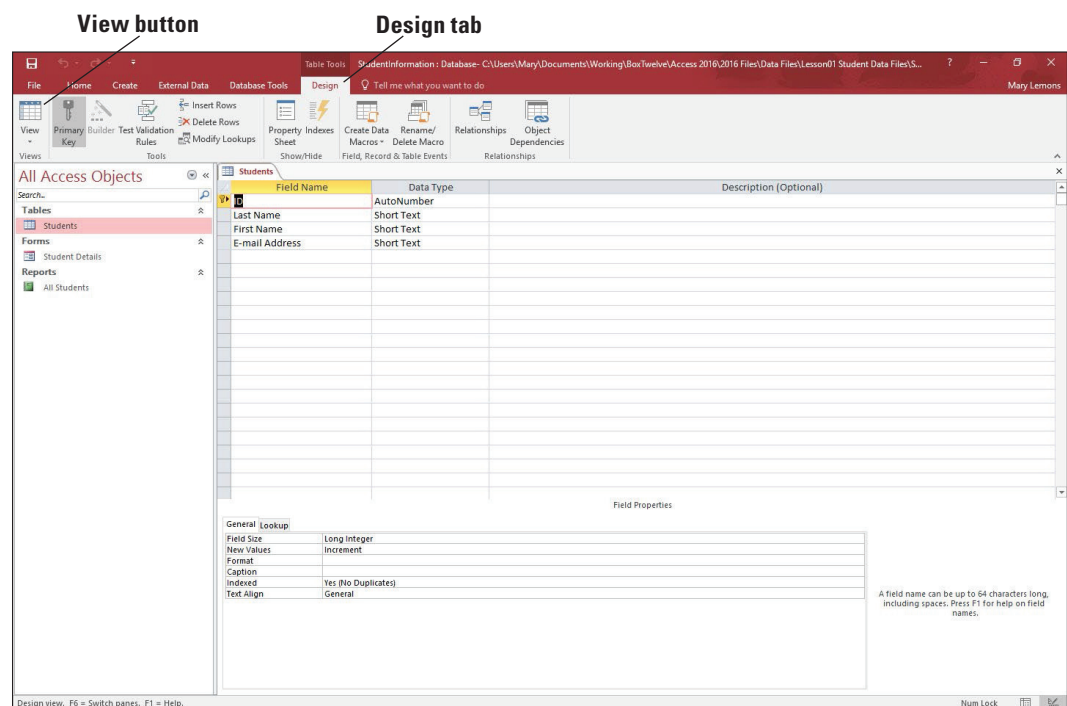
Change Views

GET READY. USE the *Student Information* database you used in the previous exercise. The Students table should be displayed in the Access work area.

1. On the Home tab, in the Views group, click the **down arrow** on the View button.
2. Click **Design View**. The table is displayed in Design View, as shown in Figure 1-11. Notice that the Design tab is now displayed on the Ribbon.

Figure 1-11

The table shown in Design View



3. On the Design tab, in the Views group, click the **down arrow** on the View button and then click **Datasheet View**.
4. On the Ribbon, in the Table Tools group, click the **Fields** tab to display the contextual commands for that view.

PAUSE. LEAVE the database open to use in the next exercise.

SELECTING TOOLS AND COMMANDS

A **command** is a tool (such as an icon, a button, or a list) that tells Access to perform a specific task. Each tab provides commands that are relevant to the kind of task you are performing. Many of the tools and commands for working with Access are accessible through the Access Ribbon. In

addition to the Ribbon, Access also offers tools and commands on the File menu (also known as **Backstage view**), a Quick Access toolbar, and a status bar (refer to Figure 1-1). In this section, you explore the Ribbon, which displays **groups** of common commands arranged by tabs.

Using the Ribbon

The Ribbon is located across the top of the screen and contains tabs and groups of commands. It is divided into several tabs, which organize tasks according to similar commands you'd like to perform on a database. The Ribbon is contextual, which means it offers you commands related to the object that you are working on or the task that you are performing.

Some groups have a **dialog box launcher**, which is a small arrow in the lower-right corner of the group that you click to launch a dialog box or task pane that displays additional options or information. Some commands on the Ribbon have small arrows pointing down. These arrows indicate that a menu is available that lists more options from which you can choose.

In the next exercise, you will practice using the Ribbon.

STEP BY STEP

Use the Ribbon

GET READY. USE the **Student Information** database that is still open from the previous exercise.

1. Click the **Home** tab to make it active. As shown in Figure 1-12, the Ribbon is divided into groups of commands. Notice the dialog box launcher in the lower-right corner of the Clipboard group.

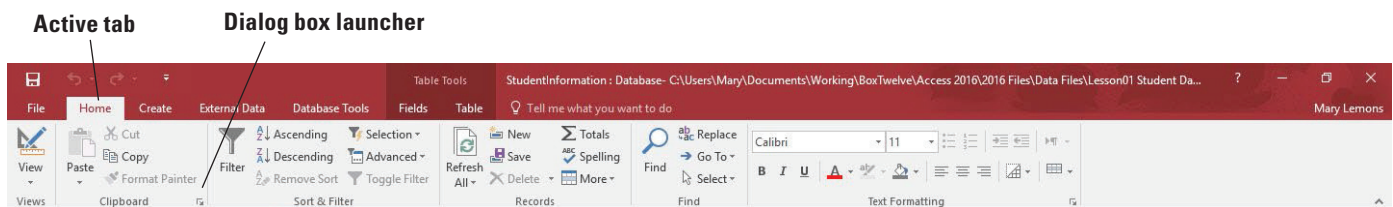


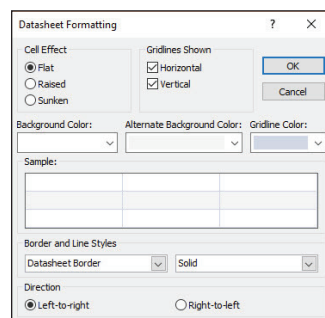
Figure 1-12

The Ribbon and dialog box launcher

2. Click the **Create** tab to make it the active tab. Notice that the groups of commands change.
3. Click **External Data** and then click **Database Tools** to see the commands available on those tabs.
4. Click the **Home** tab.
5. On the Students Object tab, click the **ID** column header in the table to select the ID column.
6. Click the **dialog box launcher** in the lower-right corner of the Text Formatting group. *The Datasheet Formatting dialog box appears, as shown in Figure 1-13.*

Figure 1-13

The Datasheet Formatting dialog box



7. Click **Cancel** to close the dialog box.
8. Double-click the **Home** tab. Notice the groups are hidden to give you more screen space to work with your database.
9. Double-click **Home** again to display the groups.
10. Click **File** and then click **Close** to close the database. Access appears with no database open.



Troubleshooting

If you click the Close button (the X in the upper-right corner), Access closes and you will have to reopen it for the next exercise.

PAUSE. LEAVE Access open to use in the next exercise.

Take Note You can customize the Ribbon to have greater control over the commands that appear on it by turning off tabs and groups you rarely use, moving and/or duplicating groups from one tab to another, creating custom groups, and even creating custom tabs.

Using the Backstage View

Microsoft introduced Backstage view in Office 2010. The **Backstage view** (Figure 1-14) displays when you click the File tab from an open database and contains a menu of options and commands that allows you to access various screens to perform common tasks with your database files—such as creating a new database, opening, saving, printing, closing, and changing user account settings and options. You can click several options and commands to view related screens containing various options and commands used to create and manage your database. The Back button returns you to the Access database workspace.

Figure 1-14

Backstage view



The following is an overview of the options in the Backstage view:

- **Info:** Default view. Use this option to view the current database file path and view and edit database properties. Compact and repair the database and encrypt the database with a password to restrict access.
- **New:** Use this option to create a new database from scratch or from available templates.
- **Open:** Use this option to open an existing database and view a list of recently accessed databases.
- **Save:** Use this option to return to the open database window where objects can be saved.
- **Save As:** Use this option to save the current database object (such as a table, query, form, or report) as a new object or save the database in another format that is compatible with earlier versions of Access. You can save the database to a document management server for sharing or you can package the database and apply a digital signature.
- **Print:** Use this option to quick-print to a printer, open a dialog box from which to choose print options, or preview your document before printing.
- **Close:** Use this option to close the open database but keep the Access application open.
- **Account:** Use this option to view and modify user account settings, change application background and theme, add a service, manage your Office 365 account, update office, and learn more about Access.
- **Options:** Use this option to customize language, display, proofing, and other settings.
- **Feedback:** Opens the Windows Feedback dialog box, which allows you to provide feedback to Microsoft and explore other users' feedback.

STEP BY STEP

Use the Backstage View

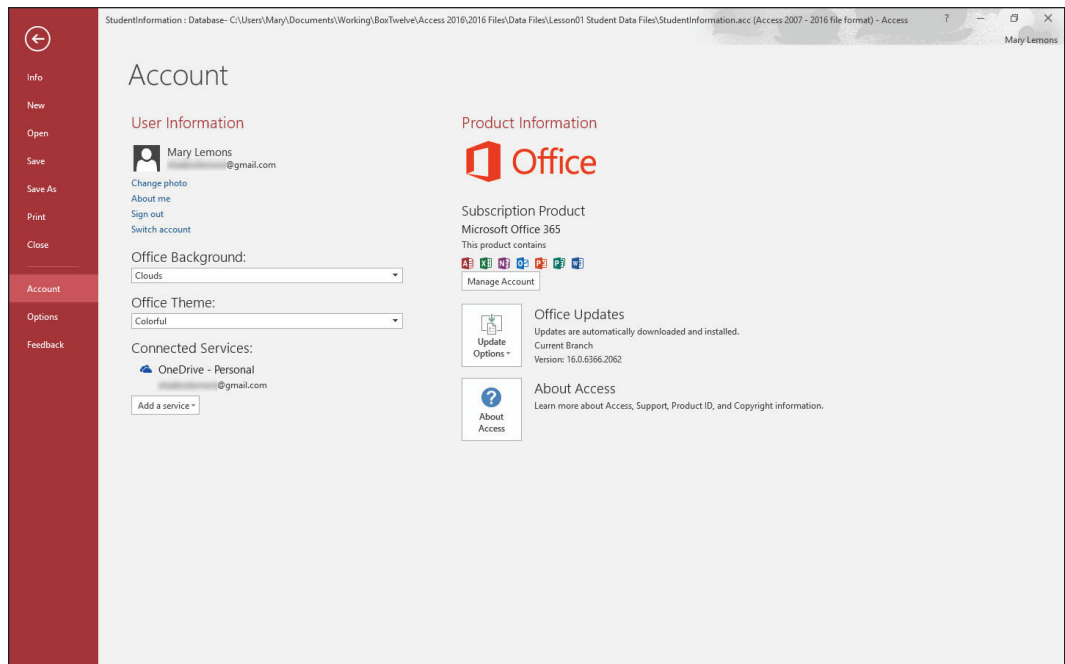
GET READY. START Access if it's not already running.

1. Click the **File** tab. Backstage view opens.
2. Click **Open** and then navigate to the **StudentData** database from the data files for this lesson.
3. Click **File** again. Backstage view now displays a menu of options down the left side of the window and information about the currently opened database.
4. Click the **New** option to view the options and commands available.
5. Click the **Save As** option to view more options and commands.
6. Select **Access Database (*.accdb)** if it's not already selected.
7. Click the **Save As** button in the right pane under the Save Database as area to save the Student Data file as **StudentData-final**. Click **Yes** in the dialog box that appears informing you that the objects will be closed.
8. Select the location to save the file and then click **Save**. The new database file opens automatically.
9. Select **File** again to re-open Backstage view.
10. Click the **Print** option to view more options and commands.
11. Click the **Account** option to view the options and commands shown in Figure 1-15.
12. Click the **Options** option to view more options and commands.
13. Click the **Cancel** button to close the *Access Options* dialog box and return to the Access workspace.

PAUSE. LEAVE the database open to use in the next exercise.

Figure 1-15

The Account options



DEFINING DATA NEEDS AND TYPES

To create a database that achieves your goals and provides you with up-to-date, accurate information, you need to spend time planning and designing it.

When planning a database, the first step is to consider the purpose of your database. You need to design the database so that it accommodates all your data-processing and reporting needs. You should gather and organize all the information that you want to include, starting with any existing forms or lists, and think about the reports and mailings you might want to create using the data.

Once you have decided how the information will be used, the next step is to categorize the information by dividing it into subjects such as Products or Orders, which become the tables in your database. Each table should only contain information that relates to that subject. If you find yourself adding extra information, create a new table.

In a database table, data is stored in rows and columns—similar in appearance to a spreadsheet. Each row in a table is called a **record**. Each column in a table is called a **field**. For example, if a table is named “Student List,” each record (row) contains information about a different student and each field (column) contains a different type of information about a student, such as last name or email address.

Once you have decided to create a Student List table, you need to determine what information you want to store in the table—such as age, birthdate, or tuition. Organize each piece of information into the smallest useful part—for example, use First Name and Last Name instead of just Name if you want to sort, search, calculate, or report using either a first name or a last name (or both). These pieces of information will eventually become your fields (columns), and each record (row) will then contain complete information about each student.

For each table, you will choose a primary key. A **primary key** is a column that uniquely identifies each row, such as Student ID Number. In the case of our Student List table, the primary key (Student ID Number) uniquely identifies each student.

Reviewing Database Fields

Reviewing preexisting database fields can give you an idea of the type of information that you can store in a database. In this exercise, you open a database that is further along in the process of being developed and view the fields in a form to see what a more advanced database looks like.

STEP BY STEP

Review Database Fields

GET READY. USE the *StudentData-final* database that is still open from the previous exercise.

1. On the Student List form, click the **ID** for record 5 to display the *Student Details* dialog box for Sharon Hoepf, as shown in Figure 1-16.

Figure 1-16

The Student Details dialog box

Clip art courtesy of Microsoft

2. Click the **Guardian Information** tab and then click the **Emergency Information** tab. Each field on each tab is an example of the type of information that could be contained in a database table.
3. Click **Close** to close the *Student Details* dialog box.

PAUSE. LEAVE the database open to use in the next exercise.

Defining and Modifying Data Types for Fields

When designing the database, you set a **data type** for each field (column) that you create to match the information it will store. A data type controls the type of data a field will contain—whether it is text, number, date/time, or some other type of data. When defining table fields, it is important to define them as specifically as possible. For example, if you are using a number, you should determine whether you need to use the Currency data type, the Calculated data type, or the Number data type. Or, if you need to store large amounts of text, you may need to use the Long Text data type (up to 64,000 characters) instead of the Short Text data type (255 characters). Sometimes you may also need to modify data types for preexisting fields.

Access provides 11 data types, each with its own purpose. Table 1-1 describes the types of data that each field can store.

Table 1-1

Types of data stored in fields

Data Type	Example	Description
Short Text	Last Name: D'Amato Street: 1234 Landau Ave.	The most common data type for fields. Can store up to 255 characters of text, and numbers (or a combination of both).
Long Text	Comments: Student will make monthly payments on the 15th of each month of \$247.	Stores large amounts of text—up to 1 gigabyte (GB)—but only the first 64,000 characters of text, and numbers (or a combination of both) will be visible on the screen.
Number	Age: 19 Grade: 95.5	Stores numeric data that can be used in mathematical calculations.
Date/Time	Birthday: September 5, 1972	Stores date and/or time data.
Currency	Registration Fee: \$50.00	Stores monetary data with precision to four decimal places. Use this data type to store financial data and when you don't want Access to round values.
AutoNumber	Student ID: 56	Unique values created by Access when you create a new record. Tables often contain an AutoNumber field used as the primary key.
Yes/No	Insurance: Yes	Stores Boolean (true or false) data. Access uses 1 for all Yes values and 0 for all No values.
OLE Object	Photo	Stores images, documents, graphs, and other objects from Office and Windows-based programs.
Hyperlink	Web addresses	Stores links to websites, sites or files on an intranet or Local Area Network (LAN), and sites or files on your computer.
Attachment	Any supported type of file	You can attach images, spreadsheet files, documents, charts, and other types of supported files (up to 2 GB per record) to the records in your database, much like you attach files to email messages.
Calculated	FullName: John Derenzo	Stores an expression based on two or more fields within the same table. Example using concatenation operator (&): First: John Last: Derenzo FullName stored as: [First]&" "&[Last]

Take Note Some of the available data types in Access 2016 can only be chosen in table Design View and not from the Data Type drop-down menu on the Ribbon. You will learn more about table Design View in Lesson 9.

When you create a new field in a table and then enter data in it, Access 2016 automatically tries to detect the appropriate data type for the new column. For example, if you type a price, such as \$10, Access recognizes the data as a price and sets the data type for the field to Currency. If Access doesn't have enough information from what you enter to detect the data type, the data type is set to Short Text. In this exercise, you practice reviewing and modifying data types.

Take Note The Short Text data type and the Long Text data type each has unique properties and size limits, depending on whether you're using them in a desktop database or an Access web app.

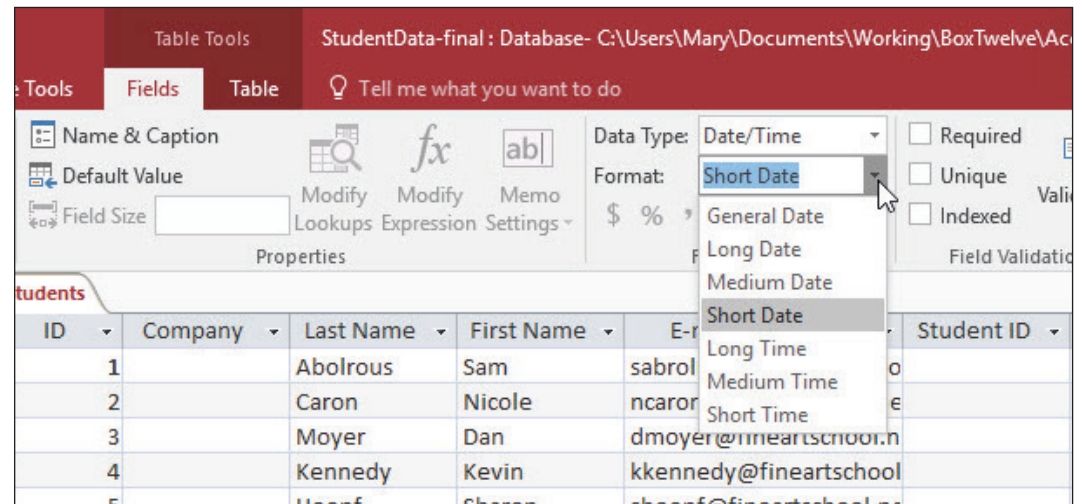
STEP BY STEP**Review and Modify Data Types for Fields**

GET READY. USE the *StudentData-final* database that is still open from the previous exercise.

1. **CLOSE** the Student List form.
2. In the Navigation Pane, in the Students group, double-click **Students: Table** to open it.
3. Click the **Date of Birth** field header.
4. On the Ribbon, click the **Fields** tab. Notice in the Formatting group that the Data Type is Date/Time.
5. In the Format box, click the **down arrow** to display the menu of formatting options for that type, as shown in Figure 1-17.

Figure 1-17

Format options for the Date/Time data type



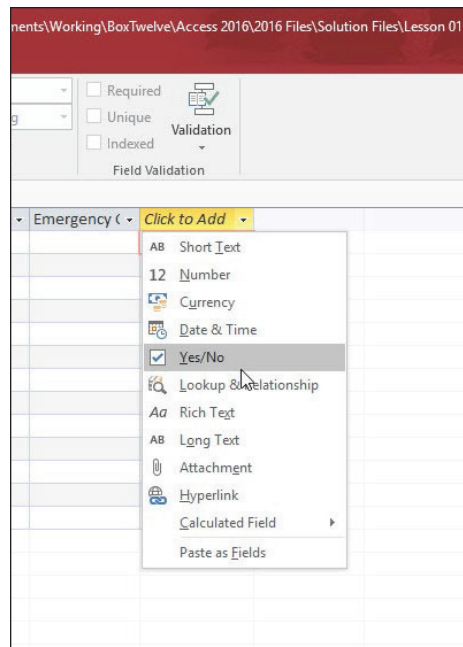
6. Click the **Last Name** header. Notice that the Data Type is Short Text and that no formatting options are available for that data type.
7. Scroll to the right and then click the **Address** header.
8. In the Data Type box, click the **down arrow** and then click **Short Text** to change the data type.

Take Note Be aware that changing a data type might cut off some or all of the data in a field; in some cases, it might remove the data entirely.

9. Scroll to the far right and then click the **Click to Add** column header. In the Data Type drop-down list that appears, select **Yes/No** (see Figure 1-18). Once you click Yes/No, notice the name of the column header, Field1, is highlighted.

Figure 1-18

The Click to Add menu options



10. Rename the field by typing **Additional Contact Info on File?**. Press **Enter** and then click the **Additional Contact Info on File?** header.
11. On the Ribbon, in the Formatting group, click the **down arrow** in the Format box to display the menu of formatting options for the Yes/No data type.
12. Click outside the menu to close it.

PAUSE. LEAVE the database open to use in the next exercise.

Take Note The Number data type should be used only if the numbers will be used in mathematical calculations. For numbers such as phone numbers, use the Short Text data type.

Defining Database Tables

Tables are the most basic organizational element of a database. Not only is it important to plan the tables so they will hold the type of data you need, it's important to plan how the tables and information will be connected. In this exercise, you view a visual representation of the relationship between two tables.

In a simple database, you might have only one table. Most databases, however, will have more than just one table. The tables you include in a database will be based on the data available. For example, a database of students might have a table for contact information, a table for grades, and a table for tuition and fees.

In database applications like Access, you can create a relational database. A **relational database** stores information in separate tables and these tables are connected or linked by a defined relationship that ties the data together.

STEP BY STEP

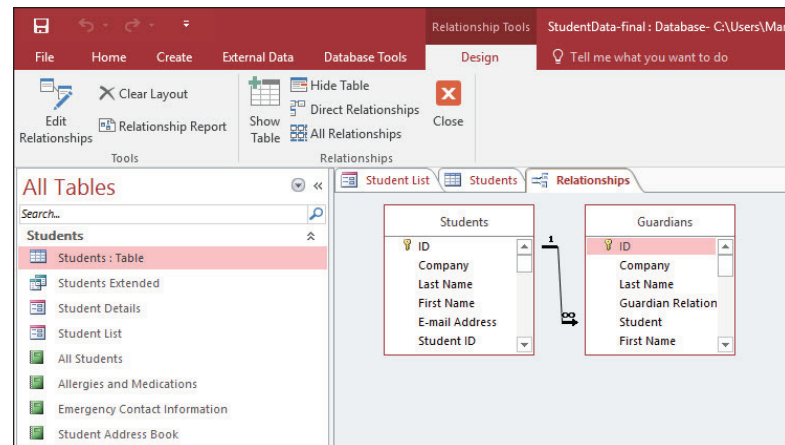
Define Database Tables

GET READY. USE the *StudentData-final* database that is still open from the previous exercise.

1. On the Database Tools tab, in the Relationships group, click **Relationships** to display a visual representation of the relationship between the Students and Guardians tables, as shown in Figure 1-19.

Figure 1-19

A relationship between tables



2. **CLOSE** the Relationships tab.
3. **CLOSE** the Students tab.
4. **CLOSE** the Student List tab.

STOP. CLOSE the database and Access.

An important principle to consider when planning a database is to try to record each piece of information only once. Duplicate information, or **redundant data**, wastes space and increases the likelihood of errors. Relationships among database tables help ensure consistency and reduce repetitive data entry.

As you create each table, keep in mind how the data in the tables are related to each other. Enter test data and then add fields to tables or create new tables as necessary to refine the database. The last step is to apply data normalization rules to see if your tables are structured correctly and make adjustments as needed. **Normalization** is the process of applying rules to your database design to ensure that you have divided your information items into the appropriate tables.

Database design principles include standards and guidelines that can be used to determine if your database is structured correctly. These are referred to as **normal forms**. There are five normal forms, but typically only the first three are applied, because that is usually all that is required. The following is a summary of the first three normal forms:

- **First Normal Form (1NF):** This form divides each field according to its smallest meaningful value, removes repeating groups of data, and creates a separate table for each set of related data.
- **Second Normal Form (2NF):** With this form, each non-key column should be fully dependent on the entire primary key. Create new tables for data that applies to more than one record in a table and add a related field to the table.
- **Third Normal Form (3NF):** Use this form to remove fields that do not relate to, nor provide a fact about, the primary key.

Before normalizing a database and defining fields for the efficient storage of data in tables, it's important to know where your data will come from. Data can be brought into an Access database in a number of ways, including linking and importing. When defining tables, you have to decide whether data should be linked to or imported from external sources. When you import data, Access creates a copy of the data or objects in the destination database without altering the source. Linking lets you connect to data from another source without importing it, so that you can view and modify the latest data in both the source and destination databases without creating and maintaining two copies of the same data thereby reducing redundant data. Any changes you make to the data in the source are reflected in the linked table in the destination database, and vice versa. You find out more about normalizing tables in Lesson 9.

Knowledge Assessment

Matching

Match the term in Column 1 to its description in Column 2.

Column 1	Column 2
1. Record	a. Row in a database table
2. Field	b. Database object that asks a table a question
3. Query	c. Database object that simplifies the process of entering, editing, and displaying data
4. Form	d. Column in a database table
5. Data type	e. Kind of information a field contains

True/False

Circle **T** if the statement is true or **F** if the statement is false.

- T F** 1. Any list you make for a specific purpose—even a grocery list—can be considered a simple database.
- T F** 2. By default, the Navigation Pane appears on the right side of the Access screen each time you create or open a database.
- T F** 3. Forms, queries, and reports are examples of database objects.
- T F** 4. In a database table, data is stored in rows and columns—similar in appearance to a spreadsheet.
- T F** 5. An important principle to consider when planning a database is to try to record each piece of information as many times as possible for easy access.

Projects

Project 1-1: Using the Navigation Pane

As a busy editor at Lucerne Publishing, you use Access to organize and manage your task list. In this project, you will use the Navigation Pane to organize your task list.

GET READY. LAUNCH Access if it is not already running.

1. **OPEN** *Task List* from the data files for this lesson and then **SAVE** it as *Task List-final*.
2. To display the Navigation Pane, click the **Shutter Bar Open/Close** button.
3. Click the **Contacts** group header in the Navigation Pane to display those database objects.
4. Click the **Supporting Objects** group header to display those database objects.
5. In the Supporting Objects group, double-click **Tasks** to open that table.
6. In the Tasks group, double-click **Tasks by Assigned To** to open that report and view data taken from the Tasks table.
7. In the Navigation Pane, click the **Tasks Navigation** header to display the menu and then click **Object Type**. Notice that the Objects are now displayed by type, such as Tables, Queries, Forms, and Reports.
8. **SAVE** and then **CLOSE** the database.

PAUSE. LEAVE Access open for the next project.

Project 1-2: Creating a Database and Selecting Data Types

You are a volunteer for the Tech Terrace Neighborhood Association that holds an annual March Madness 5K Run. In the past, all data has been kept on paper, but you decide it would be more efficient to create a database. In this project, you will create a database and select data types.

GET READY. LAUNCH Access if it is not already running.

1. Click **File**, click **New**, and then double-click **Blank desktop database**.
2. In the Blank desktop database screen that appears in the center of the screen, type **Runners-final** in the File Name box. Click **Create**.
3. Click **Click to Add**, select **Short Text**, and then type **Runner Number**.
4. Click **Click to Add**, select **Short Text**, and then type **First Name**.
5. Click **Click to Add**, select **Short Text**, and then type **Last Name**.
6. Click **Click to Add**, select **Number**, and then type **Age**.
7. Click **Click to Add**, select **Short Text**, and then type **First Race?**.
8. Click **Click to Add**, select **Number**, and then type **Previous 5K Time**.
9. Click the **First Race** header and then change the Data Type to **Yes/No**.
10. **SAVE** and then **CLOSE** the object.
11. Rename Table 1 to **Runners**.
12. Click **OK**.

CLOSE the database and then **EXIT** Access.
